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(Original Signature of Member)

109<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

**H. R.** \_\_\_\_\_

To authorize programs relating to science, mathematics, engineering, and technology education at the National Science Foundation and the Department of Energy Office of Science, and for other purposes.

\_\_\_\_\_  
**IN THE HOUSE OF REPRESENTATIVES**

Mr. SCHWARZ of Michigan introduced the following bill; which was referred to the Committee on \_\_\_\_\_

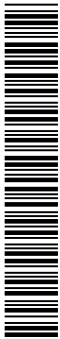
\_\_\_\_\_  
**A BILL**

To authorize programs relating to science, mathematics, engineering, and technology education at the National Science Foundation and the Department of Energy Office of Science, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Science and Mathe-  
5 matics Education for Competitiveness Act”.



1 **SEC. 2. ROBERT NOYCE TEACHER SCHOLARSHIP PRO-**  
2 **GRAM.**

3 Section 10 of the National Science Foundation Au-  
4 thorization Act of 2002 (42 U.S.C. 1862n—1) is  
5 amended—

6 (1) by inserting “Teacher” after “Noyce” in  
7 the section heading and each place it appears in the  
8 text;

9 (2) in subsection (c)(3)—

10 (A) by striking “\$7,500” and inserting  
11 “\$10,000”; and

12 (B) by striking “of scholarship support”  
13 and inserting “of scholarship support, unless  
14 the Director establishes a policy by which part-  
15 time students may receive additional years of  
16 support”;

17 (3) in subsection (c)(4), by inserting “with a  
18 maximum service requirement of 4 years” after “was  
19 received”;

20 (4) in subsection (d)(3), by striking “1 year”  
21 and inserting “16 months”;

22 (5) in subsection (d)(4), by striking “for each  
23 year a stipend was received”;

24 (6) in subsection (g)(2)(A)—



1 (A) by striking “Treasurer of the United  
2 States,” and inserting “Treasurer of the United  
3 States.”; and

4 (B) by striking “multiplied by 2.”

5 (7) in subsection (i)(3), by inserting “or had a  
6 career in” after “is working in”; and

7 (8) by adding at the end the following:

8 “(j) AUTHORIZATION OF APPROPRIATIONS.—Except  
9 as provided in subsection (k), there are authorized to be  
10 appropriated to the Director for the Robert Noyce Teacher  
11 Scholarship Program—

12 “(1) \$50,000,000 for fiscal year 2007, of which  
13 at least \$7,500,000 shall be used for capacity build-  
14 ing activities described in subsection (a)(3)(A)(ii)  
15 and (iii) and (B)(ii) and (iii);

16 “(2) \$70,000,000 for fiscal year 2008, of which  
17 at least \$10,500,000 shall be used for capacity  
18 building activities described in subsection  
19 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

20 “(3) \$90,000,000 for fiscal year 2009, of which  
21 at least \$13,500,000 shall be used for capacity  
22 building activities described in subsection  
23 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

24 “(4) \$90,000,000 for fiscal year 2010, of which  
25 at least \$13,500,000 shall be used for capacity



1 building activities described in subsection  
2 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii); and

3 “(5) \$90,000,000 for fiscal year 2011, of which  
4 at least \$13,500,000 shall be used for capacity  
5 building activities described in subsection  
6 (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii).

7 “(k) EXCEPTION.—For any fiscal year for which the  
8 funding allocated for activities under this section is less  
9 than \$50,000,000, the amount of funding available for ca-  
10 pacity building activities described in paragraphs (1)  
11 through (5) of subsection (j) shall not exceed 15 percent  
12 of the allocated funds.”

13 **SEC. 3. SCIENCE AND MATHEMATICS TEACHER TRAINING**  
14 **PARTNERSHIPS.**

15 (a) IN GENERAL.—Section 9 of the National Science  
16 Foundation Authorization Act of 2002 (42 U.S.C. 1862n)  
17 is amended to read as follows:

18 **“SEC. 9. SCIENCE AND MATHEMATICS TEACHER TRAINING**  
19 **PARTNERSHIPS PROGRAM.**

20 “(a) PROGRAM AUTHORIZED.—

21 “(1) IN GENERAL.—(A) The Director shall  
22 carry out a program to award grants to institutions  
23 of higher education or eligible nonprofit organiza-  
24 tions (or consortia of such institutions or organiza-  
25 tions) to establish science and mathematics teacher



1 training partnership programs to improve elemen-  
2 tary and secondary science and mathematics instruc-  
3 tion.

4 “(B) Grants shall be awarded under this sub-  
5 section on a competitive, merit-reviewed basis.

6 “(2) PARTNERSHIPS.—To be eligible to receive  
7 a grant under this subsection, an institution of high-  
8 er education through 1 or more of its departments  
9 in science, mathematics, or engineering or an eligible  
10 nonprofit organization (or a consortium thereof)  
11 shall enter into a partnership with 1 or more local  
12 educational agencies that may also include 1 or more  
13 businesses.

14 “(3) REQUIRED USES OF FUNDS.—Grants  
15 awarded under this subsection shall be used for ac-  
16 tivities that draw upon the expertise of the partners  
17 to improve teacher content knowledge in science or  
18 mathematics at the elementary or secondary levels,  
19 such as conducting—

20 “(A) intensive, content-specific teacher in-  
21 stitutes, which may include the provision of sti-  
22 pends or expenses for participants;

23 “(B) model induction programs for teach-  
24 ers in their first 2 years of teaching; and



1 “(C) programs to expand the knowledge of  
2 existing teachers through sustained, content-  
3 specific professional development programs.

4 “(4) ADDITIONAL USES OF FUNDS.—Grants  
5 awarded under this subsection may also be used to  
6 conduct—

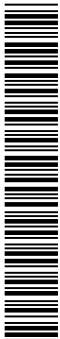
7 “(A) programs to train, in both content  
8 and pedagogy, teacher leaders who will be  
9 granted sufficient nonclassroom time to serve as  
10 mentor teachers, as demonstrated by assur-  
11 ances their employing school has provided to  
12 the Director, in such time and such manner as  
13 the Director may require;

14 “(B) programs to train teachers to incor-  
15 porate new technologies into their classroom;  
16 and

17 “(C) programs to train teachers to incor-  
18 porate laboratory experiences into their lesson  
19 plans.

20 “(b) SELECTION PROCESS.—

21 “(1) APPLICATION.—An institution of higher  
22 education or eligible nonprofit organization seeking  
23 funding under subsection (a) shall submit an appli-  
24 cation to the Director at such time, in such manner,  
25 and containing such information as the Director



1       may require. The application shall include, at a  
2       minimum—

3               “(A) a description of the partnership and  
4       the role that each member will play in imple-  
5       menting the proposal;

6               “(B) a description of the activities to be  
7       carried out, including—

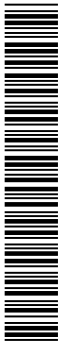
8                       “(i) the number of teachers to be  
9       served;

10                      “(ii) how such activities will be  
11       aligned with State science and mathe-  
12       matics achievement standards;

13                      “(iii) how such activities will increase  
14       the number or percentage of science and  
15       mathematics teachers who are highly quali-  
16       fied teachers, as defined in section 9101 of  
17       the Elementary and Secondary Education  
18       Act of 1965 (20 U.S.C. 7801); and

19                      “(iv) how such activities will reduce  
20       the attrition of science and mathematics  
21       teachers;

22               “(C) a description of the need for qualified  
23       science and mathematics teachers in the area to  
24       be served;



1 “(D) a description of the manner in which  
2 the partnership will be continued after assist-  
3 ance under this program concludes; and

4 “(E) a description of how the partnership  
5 will evaluate the impact of the program.

6 “(2) REVIEW OF APPLICATIONS.—In evaluating  
7 the applications submitted under paragraph (1), the  
8 Director shall consider, at a minimum—

9 “(A) the ability of the partners to effec-  
10 tively carry out the proposed programs;

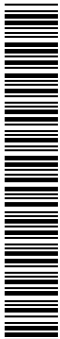
11 “(B) the extent to which effective practices  
12 can be identified and replicated; and

13 “(C) the extent to which the evaluation de-  
14 scribed in paragraph (1)(E) will be independent  
15 and based on objective measures.

16 “(3) AWARDS.—In awarding grants under this  
17 section, the Director shall give priority consideration  
18 to applications in which the partnership includes a  
19 high-need local educational agency and to applica-  
20 tions that include activities described in subsection  
21 (a)(4)(A).

22 “(4) MAXIMUM GRANT.—A grant awarded  
23 under this section shall not be less than \$75,000 or  
24 greater than \$2,000,000 for any fiscal year.

25 “(c) ACCOUNTABILITY AND DISSEMINATION.—

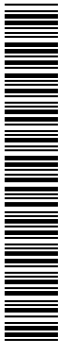




1           “(1) ASSESSMENT REQUIRED.—Not later than  
2           2 years after the date of enactment of this section,  
3           the Director shall establish a common set of bench-  
4           marks and assessment tools to allow for the com-  
5           parison of practices across grantees.

6           “(2) REPORT.—Not later than 4 years after the  
7           date of enactment of this section, the Director shall  
8           perform an assessment of the effectiveness of the  
9           Science and Mathematics Teacher Training Partner-  
10          ships Program established by this section in improv-  
11          ing elementary and secondary science and mathe-  
12          matics instruction. Not later than 5 years after the  
13          date of enactment of this section, the Director shall  
14          transmit a report describing the results of this as-  
15          sessment to the Committee on Science and the Com-  
16          mittee on Education and the Workforce of the  
17          House of Representatives and to the Committee on  
18          Commerce, Science, and Transportation and the  
19          Committee on Health, Education, Labor, and Pen-  
20          sions of the Senate. Such reports shall be made  
21          widely available to the public.

22          “(d) AUTHORIZATION.—There are authorized to be  
23          appropriated to the National Science Foundation for the  
24          purpose of this section \$50,000,000 for each of the fiscal  
25          years 2007 through 2011.”.



1 (b) DEFINITIONS.—Section 4 of the National Science  
2 Foundation Authorization Act of 2002 (42 U.S.C. 1862n  
3 note) is amended—

4 (1) by amending paragraph (6) to read as fol-  
5 lows:

6 “(6) ELIGIBLE NONPROFIT ORGANIZATION.—  
7 The term ‘eligible nonprofit organization’ means a  
8 nonprofit organization, such as a museum or science  
9 center, involved in the preparation, training, or cer-  
10 tification of science and mathematics teachers.”;

11 (2) by amending paragraph (8) to read as fol-  
12 lows:

13 “(8) HIGH-NEED LOCAL EDUCATIONAL AGEN-  
14 CY.—The term ‘high-need local educational agency’  
15 means a local educational agency that—

16 “(A) is receiving grants under title I of the  
17 Elementary and Secondary Education Act of  
18 1965 (20 U.S.C. 6301 et seq) as a result of  
19 having within its jurisdiction concentrations of  
20 children from low income families; and

21 “(B) is experiencing a shortage of highly  
22 qualified teachers, as defined in section 9101 of  
23 the Elementary and Secondary Education Act  
24 of 1965 (20 U.S.C. 7801), in the fields of  
25 science, mathematics, or engineering.”; and



(3) in paragraph (11) by striking “master teacher” and inserting “teacher leader” each place it appears.

4 (c) CONTINUING GRANTS.—This section shall not be  
5 construed to terminate any Mathematics and Science  
6 Partnership awards made prior to the date of enactment  
7 of this Act.

8 SEC. 4. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH-  
9 MATICS TALENT EXPANSION PROGRAM.

There are authorized to be appropriated to the Director of the National Science Foundation for the Science, Technology, Engineering, and Mathematics Talent Expansion Program, \$40,000,000 for fiscal year 2007, \$45,000,000 for fiscal year 2008, \$50,000,000 for fiscal year 2009, \$50,000,000 for fiscal year 2010, and \$50,000,000 for fiscal year 2011.

17 SEC. 5. INTEGRATIVE GRADUATE EDUCATION AND RE-  
18 SEARCH TRAINEESHIP PROGRAM.

(a) FUNDING.—For each of the fiscal years 2007 through 2011, the Director of the National Science Foundation shall allocate at least 1.5 percent of funds appropriated for Research and Related Activities to the Integrative Graduate Education and Research Traineeship program.



1 (b) COORDINATION.—The Director shall coordinate  
2 with Federal departments and agencies, as appropriate,  
3 to expand the interdisciplinary nature of the Integrative  
4 Graduate Education and Research Traineeship program.

5 (c) AUTHORITY TO ACCEPT FUNDS FROM OTHER  
6 AGENCIES.—The Director is authorized to accept funds  
7 from other Federal departments and agencies to carry out  
8 the Integrative Graduate Education and Research  
9 Traineeship program.

10 **SEC. 6. ESTABLISHMENT OF CENTERS FOR UNDER-**  
11 **GRADUATE EDUCATION IN SCIENCE, MATHE-**  
12 **MATICS, AND ENGINEERING.**

13 (a) ESTABLISHMENT.—

14 (1) IN GENERAL.—(A) The Director of the Na-  
15 tional Science Foundation shall carry out a program  
16 to award grants to departments of science, mathe-  
17 matics, or engineering at institutions of higher edu-  
18 cation (or consortia thereof) to establish Centers for  
19 Undergraduate Education in Science, Mathematics,  
20 and Engineering. The program shall be designed to  
21 promote the development of curriculum, teaching  
22 methods, and teacher training methods to improve  
23 the quality of undergraduate science, mathematics,  
24 and engineering courses and increase the number of  
25 students taking such courses, including nonmajors.



1 (B) The grants shall be made jointly through  
2 the Education and Human Resources Directorate  
3 and at least 1 research directorate of the National  
4 Science Foundation.

5 (C) Grants under this section shall be awarded  
6 on a competitive, merit-reviewed basis.

7 (D) Grants awarded under this section shall be  
8 for 5 years. The Director may extend a grant under  
9 this section for up to 2 additional 3-year periods.

10 (2) ACTIVITIES.—Grants awarded under this  
11 section may be used to—

12 (A) create model curricula and laboratory  
13 programs;

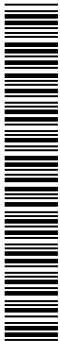
14 (B) develop and demonstrate research-  
15 based instructional methods and technologies;

16 (C) develop methods to train graduate stu-  
17 dents and faculty to be more effective teachers;

18 (D) conduct programs to disseminate cur-  
19 ricula, instructional methods, or training meth-  
20 ods to faculty at the grantee institutions and at  
21 other institutions; and

22 (E) conduct any other activities the Direc-  
23 tor determines will accomplish the goals de-  
24 scribed in paragraph (1)(A).

25 (b) SELECTION PROCESS.—



1           (1) APPLICATION.—A department of science,  
2           mathematics, or engineering of an institution of  
3           higher education (or consortium thereof) seeking  
4           funding under this section shall submit an applica-  
5           tion to the Director at such time, in such manner,  
6           and containing such information as the Director  
7           may require. At a minimum, the application shall  
8           include—

9                   (A) a description of the activities to be car-  
10                  ried out by the Center;

11                  (B) a plan for disseminating programs re-  
12                  lated to the activities carried out by the Center  
13                  to faculty at the grantee institution and at  
14                  other institutions;

15                  (C) an estimate of the number of faculty,  
16                  graduate students, and undergraduate students  
17                  who be affected by the activities carried out by  
18                  the Center; and

19                  (D) a plan for assessing the effectiveness  
20                  of the Center at accomplishing the goals de-  
21                  scribed in subsection (a)(1)(A).

22           (2) REVIEW OF APPLICATIONS.—In evaluating  
23           the applications submitted under paragraph (1), the  
24           Director shall consider, at a minimum—



1 (A) the ability of the applicant to effec-  
2 tively carry out the proposed activities, includ-  
3 ing the dissemination activities described in  
4 subsection (a)(2)(D); and

5 (B) the extent to which the faculty, staff,  
6 and administrators of the applicant institution  
7 are committed to improving undergraduate  
8 science, mathematics, and engineering edu-  
9 cation.

10 (3) AWARDS.—In awarding grants under the  
11 program, the Director shall endeavor to ensure that  
12 a wide variety of science, mathematics, and engi-  
13 neering fields and types of institutions of higher  
14 education, including 2-year colleges, are covered, and  
15 that—

16 (A) at least 1 center is housed at a Doc-  
17 toral/Research University as defined by the  
18 Carnegie Foundation for the Advancement of  
19 Teaching; and

20 (B) at least 1 center is focused on improv-  
21 ing undergraduate education in an interdiscipli-  
22 nary area.

23 (c) ANNUAL CONFERENCE.—The Director shall con-  
24 vene an annual meeting of the Centers to foster collabora-



tion among the Centers and to further disseminate the results of the Centers' activities.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation for the purpose of this section \$4,000,000 for fiscal year 2007 and \$10,000,000 for each of the fiscal years 2008 through 2011.

**SEC. 7. EVALUATION OF PROFESSIONAL SCIENCE MASTERS.**

Not earlier than 1 year after the date of enactment of this Act, the Director of the National Science Foundation shall enter into an agreement with an appropriate party to assess the impact of the Professional Science Master's (PSM) degree at a variety of institutions, including the extent to which the degree is interdisciplinary and targeted to emerging fields, the ability of graduates to obtain employment in industry relative to those who receive traditional science master's degrees, salary ranges for graduates relative to traditional science masters graduates, the extent to which the degree is terminal or graduates go on to continue their education, and the success of the degree in attracting traditionally underrepresented populations, including women and minorities. The results of such study, together with any recommendations for Federal support for Professional Science Master's pro-





1 grams, shall be submitted to the Congress not later than  
2 3 years after the date of enactment of this Act.

3 **SEC. 8. REPORT ON BROADER IMPACTS CRITERION.**

4 Not later than 1 year after the date of enactment  
5 of this Act, the Director of the National Science Founda-  
6 tion shall submit to Congress a report on the impact of  
7 the broader impacts grant criterion used by the National  
8 Science Foundation. The report shall—

9 (1) identify the criteria that each division and  
10 directorate of the Foundation uses to evaluate the  
11 broader impacts aspects of research proposals;

12 (2) provide a breakdown of the types of activi-  
13 ties by division that awardees have proposed to carry  
14 out to meet the broader impacts criterion;

15 (3) provide any evaluations performed by the  
16 National Science Foundation to assess the degree to  
17 which the broader impacts aspects of research pro-  
18 posals were carried out and how effective they have  
19 been at meeting the goals described in the research  
20 proposals;

21 (4) describe what national goals, such as im-  
22 proving undergraduate science, mathematics, and  
23 engineering education, improving K–12 science and  
24 mathematics education, promoting university-indus-  
25 try collaboration and technology transfer, and broad-



1 ening participation of underrepresented groups, the  
2 broader impacts criterion is best suited to promote;  
3 and

4 (5) describe what steps the National Science  
5 Foundation is taking and should take to use the  
6 broader impacts criterion to improve undergraduate  
7 science, mathematics, and engineering education.

8 **SEC. 9. EDUCATION PROGRAMS AT THE DEPARTMENT OF**  
9 **ENERGY.**

10 (a) AUTHORIZATION OF EDUCATION PROGRAMS.—  
11 The Secretary of Energy shall carry out education pro-  
12 grams and activities in fields related to the Department's  
13 mission, which may include awarding scholarships or fel-  
14 lowships for study and research, providing research experi-  
15 ences at National Laboratories for undergraduates, and  
16 operating summer institutes to improve the content knowl-  
17 edge of science and mathematics teachers.

18 (b) INVENTORY AND EVALUATION.—

19 (1) REPORT.—Not later than 1 year after the  
20 date of enactment of this Act, the Secretary of En-  
21 ergy shall transmit a report to the Congress which  
22 shall contain—

23 (A) an inventory of existing education pro-  
24 grams and activities at the Department and at  
25 the National Laboratories, which shall include a



1 description of each education program or activ-  
2 ity supported by the Department or the Na-  
3 tional Laboratories, a description of the in-  
4 tended beneficiaries, and the amount of Federal  
5 funding used to support it; and

6 (B) a schedule for conducting independent  
7 evaluations of the education programs and ac-  
8 tivities identified under subparagraph (A) to as-  
9 sess the impact of such programs and activities  
10 on the intended beneficiaries and the larger  
11 mission of the Department that shall result in  
12 all evaluations of the programs being completed  
13 not later than 4 years after the date of enact-  
14 ment of this Act.

15 (2) IMPLEMENTATION OF SCHEDULE.—The  
16 Secretary shall implement the schedule provided  
17 under paragraph (1)(B) and shall transmit each  
18 evaluation to the Congress as it is completed, along  
19 with a description of any actions the Secretary in-  
20 tends to take as a result of the evaluation.

21 (c) NATIONAL LABORATORIES.—The Secretary shall  
22 include the conduct of education programs at the National  
23 Laboratories and the results of any evaluations of such  
24 programs as a factor in the annual setting of the perform-



1   ance and other incentive fees for a National Laboratories  
2   management and operations contractor.

3   **SEC. 10. DEFINITION.**

4       In this Act, the term “institution of higher edu-  
5   cation” has the meaning given such term in section 101(a)  
6   of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

